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BRIEF SUMMARY OF THE INVENTION

[0005] The present invention provides a toaster that remedies, or at least minimizes, these problems. This toaster
5 includes a case having in particular lateral walls that form the outer cover of the toaster, a base in connection with the case, the case containing a frame forming a vertically open toasting chamber, on the one hand in the upper part of the case and on the other hand on the lower part of the case, in
10 the direction of the base, the chamber being provided with heating means situated in proximity to the toasting chamber and connected to a device for supplying electric power and for controlling the heating elements, the base being removable from the case. According to the invention, the base and the
15 case have a safety arrangement composed of elements that interact with one another when the case is disposed on the base, suppression of this interaction by the withdrawal of the case from the base preventing the supply of electric power to the heating elements.

20 [0006] Thus, by providing a removable base for the toaster case, it becomes easier to gain access to not only crumbs that fall into the toasting chamber but equally to residues that remain attached to the various walls around the toasting chamber. This is even more useful when the removability of

the base permits access, through the bottom of the case, to the lower part of the toasting chamber, which is difficult to reach in this specific toaster architecture, permitting a more complete cleaning of the toaster.

5 [0007] One valuable contribution of the invention is that it integrates mechanical and electrical safety in that separation of the base from the case makes it impossible to supply power to the heating elements. In effect, by facilitating access to the toasting chamber, it is desirable
10 to provide one or several safety measures to prevent operation of the toaster when the case is not positioned on the base.

[0008] In addition, since the base serves to provide thermal insulation for the toaster, operation of the toaster without the base could cause the surface on which the toaster
15 is placed to be heated to dangerously high temperatures that could lead, for example, to deterioration or damage to that surface.

[0009] Certain embodiments of the base according to the invention can be cleaned in a dishwasher.

20 [0010] Advantageously, the base has a hollow zone for collecting crumbs, this zone being located directly beneath the toasting chamber when the case is mounted on the base.

[0011] According to one form of construction of this safety arrangement, the element disposed in the case can occupy two

positions depending on whether the case is disposed or not on the base. One of these positions is located in the path of travel of the bread rack or of a piece that is movable with the bread rack, while preventing this latter from reaching the lower part of the toaster when the case is not properly connected to the base.

[0012] This form of construction permits the bread rack to be physically prevented from reaching the lowered position where it would trigger a toasting cycle by switching on the heating element supply. When the rack, or its control element, cannot reach this position, it becomes impossible to supply power to the heating elements.

[0013] According to another embodiment of the safety arrangement, the element disposed in the base is a finger and the element disposed in the case is an electric switch in the electric circuit for supplying current to the heating elements. This arrangement permits direct action on the electric supply circuit for the heating elements, which permits a wide adaptation of this device to different toaster models, independently of the internal arrangement of the different elements, and particularly of the bread rack.

[0014] Advantageously, the switch is present in the form of a contact that opens the supply circuit for the heating elements when the base is separated from the case. This

offers a supplemental safety measure by immediately halting the electric supply of the heating elements when the case is separated from the base.

[0015] The two forms of construction described above are associated primarily with embodiments where the base does not have any electric element for supplying the heating elements. For these forms of construction, electric supply of the heating elements is furnished by an electric cord connected to the heating elements and associated with the case.

[0016] According to other forms of construction, the base has an electric connector connected to a plug for connection to electric power means, the connector being of the male or female type and cooperating, when the case is disposed on the base, with a complementary part disposed on the frame or the case of the toaster and electrically connected to the heating elements.

[0017] Advantageously, the circuit for supplying power to the heating elements has an electric trigger locking the case to the base when the heating elements are being supplied with power. This arrangement, which can be used to provide additional security, assures that any disconnection of the base from the case is prevented when the heating elements are being supplied with power.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Figure 1 is a side elevational view of a first possible embodiment of the invention, with the base being separated from the case.

5 [0019] Figure 2 is an elevational end view of a first form of construction of the first embodiment with internal parts being shown and the case being attached to the base.

[0020] Figure 3 is view similar to that of figure 2, but with the base separated from the base.

10 [0021] Figures 4 and 5 are views similar to those of figures 2 and 3 respectively of a second form of construction of the first embodiment.

[0022] Figure 6a and 6b are cross-sectional views along the axis A-A' of figure 6c, showing details of construction of the
15 first embodiment of the invention.

[0023] Figure 6c is a perspective detail view of the construction shown in figures 6a and 6b.

[0024] Figure 7 is a view similar to that of figure 1 of a second possible embodiment of the invention.

20 DETAILED DESCRIPTION OF THE INVENTION

[0025] Referring to Figure 1, a toaster 1 according to a first embodiment of the invention has a case 2 at the interior of which is arranged a frame defining, in particular, a toasting chamber 8. Heating elements (not shown) are

associated with this chamber in a conventional manner. The chamber has an opening at its bottom that extends over substantially the entire surface area of the chamber.

[0026] Case 2 also has gripping handles 12a, 12b on its lateral walls, handle 12a also serving as a control element for lowering the bread rack into the toasting position. The bread rack can be of a conventional type and is not shown in figure 1. The toaster also has a control button 4 that is movable to adjust the degree of toasting desired, as well as controls 6 for special functions, such as immediate ejection of bread, defrosting, etc., all as known in the art.

[0027] According to a first configuration, case 2 contains the entire electric circuit for supplying power to the heating elements, including a power cord 10 for connection to the power mains.

[0028] According to the invention, toaster 1 further includes a base 20 that is completely removable from case 2.

[0029] According to the example shown, base 20 has a slightly protruding part 24 associated with a complementary opening 14 in case 2. Part 24 and opening 14 cooperate to guide case 2 into the correct position on base 20 when the two components are to be assembled together. Base 20 is also partially recessed at its side that faces the toasting chamber in order to present a zone for collecting crumbs.

[0030] Base 20 also advantageously has four feet 22, and case 2 could equally be provided with feet 18 and 19 that permit case 2 to rest on the work surface when base 20 has been removed for cleaning.

5 [0031] Advantageously, a mechanical latching or locking system permits case 2 to be secured to base 20 in a removable manner. For example, case 2 can be provided with a hook 16 that extends from the frame in proximity to one end of case 2, which, for the sake of description, will be referred to herein
10 as the "rear" part. Hook 16 can cooperate with any suitable retaining element installed in base 20 in order to maintain case 2 securely connected to base 20, as will be discussed in greater detail below.

[0032] In order to maintain the "front" part of case 2 in
15 position on base 20, a further attachment element, which could be constituted by foot 18, has a horizontal flange that can cooperate with a suitable retaining means 28 secured to base 20 and having a notch, or recess, for receiving the flange on foot 18.

20 [0033] Thus, when the user wishes to lock case 2 on base 20, it is only necessary to incline case 2 toward the front in a manner to insert the flange of foot 18 into the notch of means 28. Then it is only necessary to pivot case 2 in a

manner to lower the rear part of the toaster until hook 16 comes to lock on its associated retaining means in base 20.

[0034] An unlocking button 29, which can be provided on base 20 or on case 2, permits hook 16 to be released from the retaining means, thus permitting the user to separate case 2 from base 20 by a movement opposite to the closing movement described above.

[0035] A first specific form of construction of the first embodiment of the invention is shown in figures 2 and 3. Here, toaster 1 has a mechanical safety device preventing electric power from being supplied to the heating elements when base 20 is separated from case 2. Here, the bread rack is connected, at least at one of its ends, to a driver 13 that can slide vertically while being guided in grooves 15.

[0036] A part 160, connected to the frame of the toaster, is pivotable about an axis 17 against the restoring force of a spring 30, and has an extension arm 11 above this axis. Base 20 has a contact, or pin 260, that interacts with part 160. When part 160 does not interact with pin 260, the action of spring 30 maintains arm 11 in the position shown in figure 3 where arm 11 is situated in the path of travel of driver 13, thus preventing driver 13 and the associated bread rack from reaching the lowered, toasting position. Now, in this particular form of construction of the toaster, closing of the

electric supply circuit for the heating elements is achieved by driver 13, when it is in its lowered position. At this time, a projecting part 32 of driver 13 closes a switch disposed in the electric supply circuit for the heating
5 elements.

[0037] When case 2 is positioned on base 20, the cooperation between part 160 and pin 260, facilitated by a ramp 161 provided on part 160, permits arm 11 to pivot about axis 16. As a result, arm 11 moves away from the path of
10 travel of driver 13, permitting the latter to then slide downwardly to its lowered, toasting position and permitting the supply of current to the heating elements to be initiated.

[0038] In a second form of construction shown in figures 4 and 5, the safety device is an electric switch 40 connected to
15 the case or its associated frame and having a contactor 42. A piece 46 movable in a housing 47, extending from the case or its frame, is positioned in the immediate vicinity of contactor 42. Piece 46 is movable vertically and has a conical tip 48 disposed to interact with contactor 42 when
20 piece 46 is displaced upwardly. Advantageously, housing 47 can be one of the feet of the case, corresponding to foot 19 shown in figure 1, and provides support for the case when it has been separated from base 20.

[0039] In addition, base 20 has a housing 57 within which is positioned an upwardly projecting finger, or pin 56.

Housing 57 is positioned to receive housing 47 of piece 46, whereupon finger 56 will effect a relative vertical upward

5 displacement of piece 46.

[0040] When the case is installed on the base, finger 56 pushes piece 46 upwardly. This causes tip 48 to interact with contactor 42 of switch 40 in a manner to enable power to be supplied to the heating elements when a toasting cycle is

10 initiated, for example by the lowering of the bread rack to its lower toasting position. Upon removal of the case from the base, piece 46 returns, under the influence of gravity or with the aid of a restoring spring, to its original, lowered position. In that position, tip 48 no longer interacts with
15 contactor 42, thereby opening switch 40 and deactivating the circuit for supplying power to the heating elements.

[0041] Figures 6 show details of a form of construction of the first embodiment of the invention.

[0042] As shown in these figures, base 20 has a control
20 button 29 that is mounted to be vertically movable against the restoring force of a spring 94. Button 29 preferably has a projecting part 92 that is directed downwardly. One of the edges of projecting part 92 is beveled.

[0043] Base 20 also has at least one part 73 that is mounted to slide horizontally against the restoring force of a return spring 76. At one of its ends, part 73 has a lug 74. At its other end, part 73 has a flat horizontal extension piece 78 provided with a vertical opening 80. Advantageously, there are two parts 73 in base 20, with a common horizontal extension piece, transversely connecting the two parts 73, as can be understood from a consideration of figure 6c. The two parts 73 are disposed in a symmetrical manner with respect to control button 29, as is also apparent from figure 6c.

[0044] Independently of the latching, or locking, system, the base has a button 66. Button 66 is vertically movable, in a housing 68 that delimits a volume 75, in opposition to the restoring force of a return spring 70. Button 66 is disposed between the two lugs 74 such that wall 69 of housing 68 extends at least up to lugs 74, permitting lugs 74 to be able to slide into volume 75.

[0045] In addition, button 66 can slide through an opening 72 formed in the upper face of the base.

[0046] The components shown in figures 6a-6c operate in the following manner. When the case is secured on the base, push button 66 is depressed under the weight of the case, against the restoring force of spring 70, and the positions of all of the elements are as shown in figure 6b.

[0047] Spring 76 is freely movable in the horizontal direction in a manner such that interaction of hook 16 with lug or lugs 74 causes an initial compression of spring 76, followed by an expansion of spring 76 as lug or lugs 74 move
5 the latch into the recess, or notch, of hook 16.

[0048] When the user wishes to unlatch the case from the base, he presses vertically on button 29, to place it in the position shown in figure 6a. Projecting part 92 interacts then with the edge of opening 80 of extension 76, compressing
10 spring 76, until the engagement between lug or lugs 74 and hook 16 is terminated. This provokes a release of spring 70, which aids the separation of the case from the base.

[0049] A second possible embodiment of the invention is shown in figure 7, where base 20 carries the components for
15 supplying electric power to the heating elements. In particular, power cord 10 is installed in base 20 and the wires of cord 10 are connected to pins, or plugs, contained in a connector 100. Case 2 contains a complementary connector 102 connected to the circuit for supplying electric current to
20 the heating elements. Such complementary connectors are commonly used, for example, in kitchen water heating appliances of the boiler type and include the security measures necessary to prevent all access to the parts to which a voltage may be applied. In other words, the connection

between connectors 100 and 102 may be established in ways known in the art to facilitate connection and disconnection of case 2 and base 20.

[0050] This application relates to subject matter disclosed
5 in French Application number FR 03 02043, filed on February 19, 2003, the disclosure of which is incorporated herein by reference.

[0051] While the description above refers to particular
embodiments of the present invention, it will be understood
10 that many modifications may be made without departing from the spirit thereof. The accompanying claims are intended to cover such modifications as would fall within the true scope and spirit of the present invention.

[0052] The presently disclosed embodiments are therefore to
15 be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims, rather than the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be
20 embraced therein.